

Title: Snack Mix

Brief Overview:

Students will investigate a snack mix by comparing the means of the different ingredients and graphing the results. The students will create a recipe for their own snack mix which must include at least 3-5 ingredients and weigh 100 grams. The students will develop an appropriate three dimensional package to market their snack mix product. Students will use production cost and desired profit to decide on a price for the snack mix.

Link to Standards:

- **Problem Solving** Students will formulate problems from everyday and mathematical situations. Students will verify and interpret results with respect to the original.
- **Communication** Students will reflect on and clarify their own thinking about mathematical ideas and situations. Students will discuss mathematical ideas and make convincing arguments.
- **Reasoning** Students will use models, known facts, properties, and relationships to explain their thinking. Students will justify their answers and solution processes.
- **Connections** Students will apply mathematical thinking and modeling to solve problems that arise in business and in their daily lives. Students will value the role of mathematics in our culture and society.
- **Number Relationships** Students will represent numerical relationships in one- and two-dimensions graphs.
- **Statistics** Students will systematically collect, organize, and describe data. Students will construct, read and interpret tables, charts, and graphs. Students will make inferences and convincing arguments that are based on data analysis.
- **Geometry** Students will identify, describe, compare, and classify geometric figures. Students will visualize and represent geometric figures with specific attention to developing spatial sense.
- **Measurement** Students will select appropriate units and tools to measure to the degree of accuracy required in a particular situation. Students will extend their understanding of the concepts of weight and mass.

Grade/Level:

Grades 3-5

Duration/Length:

This activity should take 5 days.

Prerequisite Knowledge:

Students should have working knowledge of the following skills:

- Measuring mass in metric units
- Basic computation skills
- Graphing
- Use of a calculator
- 3-dimensional geometric figures
- Unit pricing

Objectives:

Students will:

- measure mass to the nearest gram.
- collect, organize, and display data.
- interpret graphs.
- develop a recipe using problem solving and computation skills.
- explore three-dimensional geometry.
- communicate mathematically to justify an answer.
- work cooperatively in groups.

Materials/Resources/Printed Materials:

For each group:

- 100-gram samples of commercial snack mix (5 ingredients)
- Balance scales and metric weights
- Calculator
- Student handouts - “Ballot Form”, “Snack Mix Ingredient Price List”, and “Snack Mix Recipe”
- Unifix cubes or graph paper
- Three-dimensional geometric figure templates
- Snack mix ingredients (peanuts, raisins, cashews, etc.)
- Tagboard
- Containers for ingredients and mix

- Poster paper, markers, crayons
- Food handler plastic gloves

Performance Assessment -- Development/Procedures:

Activity 1:

- Read the following introduction to students: Your class has decided to raise \$100.00 for a local animal shelter. In order to do this, your class will create packages of snack mix to sell at the spring fair. You will investigate commercial snack mixes, develop your own recipe, create packaging, and market your product.
- Discuss types of snack mixes. What makes a good snack? What do you like?
- Distribute 100g containers of snack mix to groups or pairs of students.
- Students sort and weigh each ingredient using a balance scale. Have students develop a table to record data.
- Using Unifix cubes (or graph paper) visually represent the weight of each ingredient by stacking the cubes (1 cube = 1 gram), using the same color for each individual ingredient.
- Display and discuss each group's results.
- Display in graph form (bar, line, circle, or pictograph).
- Discuss the graphs.
- Write a journal entry. Compare and contrast your graph with on other graph.

Activity 2:

- Set up ingredients in bowls, have food handler gloves, balance scales, large container (for each pair/group), and ingredient price list on a chart.
- Distribute the "Snack Mix Recipe" handout to the students. The following instructions are on the handout:

"Your task for today is to develop a recipe for a snack mix. You must use 3 to 5 ingredients. The total weight must be 100 grams. Your group must calculate the total cost of your mix using the ingredient price list. Later, you will present your recipe idea to the class and we will choose one recipe to use for our animal shelter fund-raiser."
- Allow time for each pair/group to plan the snack mix recipe.
- Students will make the snack mix following their recipe and calculate the cost.

Activity 3:

- Have the students bring in examples of 3-dimensional product packaging.
- Working in groups, have the students identify geometric shapes found on the packaging.
- Instruct the students to carefully unfold the package and discuss the shape differences.

Identify the shapes in the design.
- Discuss information found on the package.

- Task instructions:
Your task today is to individually create a package for our snack mix. Choose one of the 3-dimensional shape templates for your package and decide what information should be included on the package.
A good package should include:
 - name of the product
 - ingredients
 - weight
 - name of the producer
 - colorful, eye-catching design
- Have the students share and display their packages.

Activity 4:

- Instruct the groups to develop a 3 minute persuasive presentation for the class describing why their snack mix (make sure they name their mix) recipe should be chosen for the animal shelter fund-raiser. The students should use chart paper and markers for visual display and must include the cost of production in their presentation.
- Allow time for group presentations.
- Students will individually complete the “Secret Ballot” form. Collect the ballots and tally the results.

Activity 5:

- Task instructions:
The ecology club on another school has heard about our animal shelter fund-raiser and is interested in developing their own snack mix to raise funds for their school. Write a letter to the ecology club explaining the steps we followed to create and package our snack mix. Be sure to include what worked well and what you would do differently the next time.
- As a class, develop a rubric for evaluating the letter. (Be sure to do this BEFORE the students begin writing).

Evaluation:

- Evaluate measurement by teacher observation.
- Evaluate journal entry describing statistical analysis of snack mix.
- Evaluate the final letter using student created rubric.

Extension/Follow Up:

- Have the students set up an assembly line to create and package the actual snack mix product.
- Have the students create posters to advertise their snack mix fund-raiser to benefit the animal shelter.

- Have groups of students write and perform a television commercial for their snack mix fund-raiser.

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Snack Mix Recipe

Directions:

Your task for today is to develop a recipe for a snack mix. You must use 3 to 5 ingredients. The total weight must be 100 grams. Your group must calculate the total cost of your mix using the ingredient price list. Later, you will present your recipe idea to the class and we will choose one recipe to use for our animal shelter fund-raiser.

Ingredient	Amount in grams	Cost per gram	Total Cost
	Total = 100g		Total =

Ballot Form

Recipe: _____

I chose this recipe because _____

I think we should charge \$_____ for the product because _____

Name: _____

Snack Mix Ingredient Price List

Ingredient	Total Package Weight	Total Cost of Package
Raisins	680 g	\$1.99
Yogurt covered raisins	454 g	\$2.29
Dried pineapple	340 g	\$2.29
Pretzels	284 g	\$1.59
M&M's	454 g	\$2.59
Sunflower seeds	106 g	\$0.59
Peanuts	340 g	\$1.89
Mini marshmallows	300 g	\$0.99
Chocolate chips	340 g	\$1.42
Banana chips	397 g	\$2.29
Sesame oat bran	340 g	\$2.29